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## Prognostic Significance of Left Ventricular Fibrosis in Patients With Congenital Bicuspid Aortic Valve.

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**Authors:** Gentian Lluri, Pierangelo Renella, J Paul Finn, Gabriel Vorobiof, Jamil Aboulhosn, Arjun Deb

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### Public Summary:

Bicuspid aortic valve disease (BAV) is the most common form of congenital type of heart disease and characterized by the abnormal aortic valve having two instead of three leaflets. The disease is characterized by premature and accelerated calcification of the valve leaflets. Patients usually get diagnosed in their 2nd-4th decade but clinical factors that determine accelerated disease progression are unclear. In this study, we identify that the degree of fibrosis of the left ventricle can be regarded as a strong prognostic factor that predicts outcomes of patients with BAV. In particular the surgery free survival of patients without LV fibrosis was 98% suggesting the presence of LV fibrosis as a new prognostic factor in the evaluation of patients with BAV. The conclusions of this study may be useful in the clinical care of patients with congenital bicuspid aortic valve disease.

### Scientific Abstract:

This study sought to evaluate the prognostic value of left ventricular (LV) fibrosis assessed by late gadolinium enhancement (LGE) of the myocardium during cardiac magnetic resonance (CMR) imaging in patients with bicuspid aortic valve (BAV), which is associated with early aortic valve fibrosis and calcification. To what degree the LV myocardial wall is affected by fibrosis and its prognostic value is currently unknown. This is a retrospective, single-center study evaluating all adult patients with BAV who had CMR and followed from March 2002 to March 2016. CMR and transthoracic echocardiogram images were reviewed. Clinical data were abstracted from the electronic medical record. A total of 29 patients were included in the study, of which 11 (38%) had CMR studies that demonstrated the presence of LGE. Patients with LGE had significantly higher aortic valve mean gradients by echocardiography when compared with LGE-negative patients (30.3 +/- 7.2 mm Hg vs 14.7 +/- 3.6 mm Hg,  $p = 0.049$ ). They were also more likely to have LV hypertrophy. Patients with LGE were 10 times more likely to need aortic valve replacement within 1 year of the CMR study than did patients without LGE (55% vs 5.5%,  $p = 0.0028$ ). In conclusion, evaluation of LGE by CMR as a marker of LV myocardial fibrosis can have additional prognostic value when evaluating patients with aortic stenosis secondary to BAV.

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